

**EPA Superfund
Record of Decision:**

**TOMAH ARMORY
EPA ID: WID980610299
OU 01
TOMAH, WI
09/23/1997**

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Tomah Armory Landfill, Tomah, Monroe County, Wisconsin

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Tomah Armory Landfill (TAL) site in Tomah, Monroe County, Wisconsin, which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to the extent practicable. This decision is based upon the contents of the Administrative Record for the site.

It is anticipated that the State of Wisconsin will concur with this decision. A written confirmation is expected by September 30, 1997, and will be added to the administrative record upon receipt.

DESCRIPTION OF THE SELECTED REMEDY

The United States Environmental Protection Agency (U.S. EPA) has found that "No Action" is appropriate because contamination from the landfill poses no significant risk under the current land use and the reasonably anticipated future land use at the site. In addition, since waste material will be left in place and because there is contaminated ground water under the landfill itself, U.S. EPA is proposing groundwater monitoring to ensure that groundwater conditions at the site continue to pose no significant risk.

DECLARATION STATEMENT

U.S. EPA in cooperation with the Wisconsin Department of Natural Resources (WDNR) and one of the potentially responsible parties (PRPs) conducted a remedial investigation that identified contamination both in site soils and in ground water at the TAL and analyzed risks posed by this contamination. U.S. EPA has found that no remedial action is necessary at the TAL to ensure protection of human health and the environment. A brief description of the basis for this finding is set forth below.

For ground water, based on the information collected to date on the site contamination, site conditions, and consideration of federal and state groundwater standards, U.S. EPA is recommending no action for the groundwater contamination identified at the TAL. Groundwater contamination found downgradient of the TAL was determined to be from a source upgradient to the TAL. For groundwater contamination found under the TAL, U.S. EPA does not believe the groundwater will be used as a drinking water source. The Tomah Armory property and the rest of the City of Tomah is currently served by a municipal water service. Given that the municipal system has adequate capacity for expansion, U.S. EPA believes that any potential future development on-site would use municipal water as well. In addition, since waste material will be left in place and because there is contaminated ground water under the landfill itself, U.S. EPA is proposing groundwater monitoring to ensure the groundwater conditions at the site continue to pose no significant risk.

For surface and subsurface soils, based on the information collected to date on the site contamination, associated risks to human health and the environment, and consideration of federal and state soil standards, U.S. EPA concluded that remediation of soil is not warranted under the current and anticipated future land use. U.S. EPA believes that, given the degree of exposure associated with the current and future land use, contaminated soil

poses no significant risk to human health and the environment. Although the "No Action" decision is founded on the fact that no significant risk was determined based upon current and reasonable future land use, protections against inappropriate land use are already in place in the form of restrictive covenants enforceable by the WDNR.

Although this decision is for "No Action", EPA will conduct five-year reviews in accordance with CERCLA Section 121. The five-year reviews will be performed because hazardous substances will remain at the site, and will evaluate the status of the site including any institutional controls that are in place. If it is determined that conditions have changed at the site such that unacceptable risk at the site exists, this decision may be reopened.

U.S. EPA has determined that its response at this site is complete. Therefore, the site now qualifies for inclusion on the Construction Completion List.

**U.S. EPA Superfund
Record of Decision**

Tomah Armory Landfill Site

**Tomah, Monroe County, Wisconsin
September, 1997**

TABLE OF CONTENTS

I.	Site Description	1
II.	Site History and Enforcement Activities	1
III.	Highlights of Community Participation.....	2
IV.	Scope and Role of Response Action.....	3
V.	Site Characteristics.....	3
VI.	Summary of Site Risks.....	6
VII.	Explanation of Significant Changes.....	10
VIII.	State Concurrence.....	10

FIGURES

Figure 1	Tomah Armory Landfill Site Location Map
Figure 2	Tomah Armory Landfill Site Base Map With Phase I Sampling Locations
Figure 3	Tomah Armory Landfill Site Base Map With Phase II Soil Sampling Locations
Figure 4	Tomah Armory Landfill Site Base Map With Phase II Groundwater Sampling Locations
Figure 5	Tomah Armory Landfill Site Base Map With Landfill Boundaries and Property Parcels

TABLES

Table 1	Inorganics in Groundwater at Tomah Armory, Phase I
Table 2	Volatile/Semivolatile Organics in Groundwater at Tomah Armory, Phase I
Table 3	Groundwater Quality Data. November 1995, Volatile Organic Compounds (VOCs) and Inorganics, Tomah Armory Landfill Site, Tomah, Wisconsin, Phase II
Table 4	Groundwater Quality Data, February 1996, Volatile Organic Compounds (VOCs) and Inorganics, Tomah Armory Landfill Site, Tomah, Wisconsin, Phase II
Table 5	Occurrence Summary of Surface Soil Samples, Phase I/Phase II RI, Tomah Armory Landfill Site, Tomah, Wisconsin
Table 6	Occurrence Summary of Subsurface Soil Samples for Armory and Museum Areas, Phase I/Phase II RI, Tomah Armory Landfill Site, Tomah, Wisconsin
Table 7	Comparison of Surface Soil Data to Background Concentrations and Risk-Based Guidelines, Tomah Armory Landfill Site, Tomah, Wisconsin
Table 8	Comparison of Subsurface Soil Data to Background Concentrations and Risk-Based Guidelines, Tomah Armory Landfill Site, Tomah, Wisconsin

APPENDICES

Appendix A	- Responsiveness Summary
Appendix B	- Administrative Record

DECISION SUMMARY

I. Site Description

The Tomah Armory Landfill (TAL) is located in the northeastern section of the City of Tomah, Monroe County, Wisconsin (Figure 1). The site is bordered on the north by the City sewage disposal and treatment facility, to the east by Mill Street and a residential area, to the south by Arthur Street and a telephone museum, and to the west by Woodward Avenue which separates the site from open fields and an apartment complex to the west. Access to the site is not restricted.

The original landfilled area covered a significant portion of the area north of Arthur Street to the South Fork of the Lemonweir River in the vicinity of Mill Street and Woodward Avenue. It covered the majority of what is now the Armory property, a portion of the City of Tomah sewage treatment plant property, a portion of a property on which a museum is located and finally a small area west of Woodward Avenue. The small area west of Woodward Avenue was excavated and the excavated material was disposed off-site in the early summer of 1997, for general maintenance purposes.

Ground water in the vicinity of the TAL is currently not used for drinking water purposes. Area residences are connected to municipal water services.

II. Site History and Enforcement Activities

The Armory Landfill was owned until 1968 by the City of Tomah. Landfilling occurred at the site from 1950 until sometime between 1955 and 1960. Waste disposal methods consisted of excavation of 6 to 8 feet of surface soil, disposal of waste material in the excavated area, placement of a cover consisting of previously excavated topsoil, and a final grading process. Some of the material disposed of in the landfill may have been burned before it was buried. No disposal records regarding the types (residential, commercial, or industrial) or quantities of material buried were maintained.

The Wisconsin Army National Guard (ARNG) purchased a portion of the site in July of 1968 to support Wisconsin ARNG activities associated with the administration, logistical support, and readiness of the unit. The remainder of the site is currently used for operation of the City of Tomah wastewater treatment plant, and the operation of a telephone museum.

Prior to the purchase of the property by the ARNG, a portion of the landfill was excavated and disposed off-site in order to construct some Armory buildings. Also, during 1997, an area west of Woodward Avenue was excavated and the excavated material was disposed off-site. An area of the museum property was also graded, covered, and reseeded.

Representatives of the Wisconsin Department of Natural Resources (WDNR) and the U.S. EPA's Field Investigation Team (FIT) Investigated the site in 1984 to gain information for a preliminary assessment. A site inspection report was prepared, and the site was scored using the Hazard Ranking System (HRS). The site was placed on the National Priorities List (NPL) on July 21, 1987. The possible effects of disposal directly into an aquifer and the potential for direct contact with hazardous substances because of erosion of the landfill cap were the concerns raised during the preliminary assessment.

In January, 1988, the Agency for Toxic Substances and Disease Registry (ATSDR) prepared a preliminary health assessment for the site. The assessment lists a number of potential exposure routes including ingestion and dermal contact with ground water, surface water, and soils and inhalation of contaminated dusts or volatile compounds. The assessment was completed before the collection of any samples at the site and thus recommended environmental characterization and sampling of the site to address the environmental and human health exposure pathways.

In July, 1993, U.S. EPA, in cooperation with WDNR and the United States Geological Survey (USGS), conducted a Phase I remedial investigation (RI) at the TAL. The purpose of the Phase I RI was to collect ground water and soil samples to characterize the nature and extent of contamination and associated exposure risks. This characterization would provide a basis for deciding whether further action was necessary at the site. Results of the Phase I RI indicated that additional groundwater and soil sampling was needed to adequately characterize the site.

Research to identify parties responsible for conditions at the TAL was completed in December, 1994. U.S. EPA named the City of Tomah and the Wisconsin Department of Military Affairs as potentially responsible parties (PRPs), based on their ownership and operation of the site. U.S. EPA sent a special notice letter to PRPs in January, 1995, requesting a "good faith" proposal to continue the Phase II remedial investigation/feasibility study (RI/FS). In February 1995, the City declined the offer to perform the response action. In March, 1995 the Wisconsin Department of Military Affairs agreed to conduct the Phase II RI/FS.

III. Highlights of Community Participation

In July, 1993, U.S. EPA hosted a "kick-off" public meeting at the Tomah City Hall Council Chambers. The purpose of the meeting was to inform local residents of the Superfund process and the work to be performed under the RI.

An information repository was established in 1993 at the Tomah Public Library, 716 Superior Avenue, Tomah, Wisconsin. U.S. EPA maintains a copy of the administrative record for the site in the information repository and at the U.S. EPA Region 5 office. The RI was released to the public in April, 1997. A Proposed Plan was made available on July 22, 1997. A public meeting was held on August 19, 1997, to discuss the RI and Proposed Plan. Advertisements were placed in local newspapers to announce the public meeting and comment period. A public comment period for the Proposed Plan was established from July 25, 1997, to August 25, 1997. The public generally supports the selected remedy. The responsiveness summary is contained in Appendix A.

The public participation requirements of Sections 113 (k)(2)(B) and 117 of CERCLA, 42 U.S.C. §§ 9613 (k)(2)(B) and 9617, have been met in the remedy selection process. This decision document presents the selected remedy for the Tomah Armory Landfill Superfund site, chosen in accordance with CERCLA, as amended by SARA, and to the extent practicable, the NCP. The decision for this site is based on the Administrative Record.

IV. Scope and Role of Response Action

U.S. EPA has selected a "No Action" decision at the TAL. This decision is based on an analysis of site risks and conditions, described in detail below. The decision relies on the fact that under current land use and reasonably anticipated future land use contamination associated with the site does not pose any significant risk. Because hazardous substances will remain at the site, ground water at the site will be monitored and the U.S. EPA will conduct a five-year review in accordance with Section 121 of CERCLA to assess whether any other response is necessary.

V. Site Characteristics

The Phase I and II RI involved sampling and analysis of ground water, air, subsurface soil, and surface soil to determine site conditions. Groundwater samples were collected from residential and monitoring wells around the site. Subsurface and surface soils were collected from within the landfilled area to determine if contamination is present, and from outside the landfilled area to determine background conditions. A geophysical investigation consisting of a magnetic survey and an electromagnetic survey was conducted to determine the approximate boundaries of the landfilled area.

Based on the results of the RI, U.S. EPA examined the threats to human health and the environment through exposure by ingestion and/or direct contact with contaminants in the subsurface and surface soils. Groundwater contamination found downgradient of the TAL was determined to be from a source upgradient to the TAL. For groundwater contamination found under the TAL, U.S. EPA does not believe the groundwater will be used as a drinking water source. The Tomah Armory property and the rest of the City of Tomah is currently served by a municipal water service. Given that the municipal system has adequate capacity for expansion, U.S. EPA believes that any potential future development on-site would use municipal water as well. In addition, since waste material will be left in place and because there is contaminated ground water under the landfill itself, U.S. EPA is proposing groundwater monitoring to ensure the groundwater conditions at the site continue to pose no significant risk.

Site Conditions

Physical Features

1. Soils

Data from soil borings indicate that the TAL is underlain predominantly by tan, brown, and gray fine-grained soils. These deposits are alluvial and lacustrine in origin. Clayey sands, with the characteristics of wetland soils, were encountered in borings outside of the landfill area at depths of about 4 to 6 feet. These shallow clayey sand lenses may be associated with wetlands that are numerous in the area and occur near the site.

2. Hydrology

There are no surface water bodies onsite. Parts of the TAL site are covered with buildings and areas that are paved or covered with gravel. The landfill is slightly mounded and predominantly grass-covered. Overland flow of water during storms occurs primarily in the paved and gravel parking areas. The area is drained by storm sewers within and outside the TAL boundaries. In general, surface drainage patterns are to the north-northwest towards the south fork of the Lemonweir River.

3. Hydrogeology

Ground water at the TAL was encountered between 1 to 9 feet below ground surface, depending on the topography. Regional ground water flow in the vicinity of the TAL trends east-northeast towards the main branch of the Lemonweir River. Shallow groundwater flow, trends north-northwest towards the south fork of the Lemonweir River. Hydraulic conductivities were not measured as part of the RI. However, an average horizontal flow velocity of 28 ft/yr was calculated, based upon data collected from monitoring wells screened in similar materials at the Tomah Municipal Sanitary Landfill Superfund site, which is located on the northwest side of Tomah.

The main regional and local aquifer in the area are the sandstone formations of Late Cambrian age. The Cambrian sandstones also contain lenses of dolomite, siltstone, and shale. The aquifer varies in thickness from 50 to 2,500 feet across the region.

Virtually all drinking water within the Tomah city limits is provided by municipal services. There are five municipal wells sunk into the sandstone aquifer. Three of the wells are currently in use at depths ranging from 280 to 325 feet. Two wells are not currently used. All of the wells are within 1 to 3 miles of the site. Data collected as part of the RI indicate that the municipal wells are unaffected by contamination at the TAL.

4. Ecology

The TAL site is characterized by buildings, paved and gravel covered areas, mowed lawns, and some areas covered by shrubs. Wildlife habitat at the Armon, is limited due to lack of

vegetative cover.

Land surrounding the TAL site is predominantly residential and commercial with some vegetated areas associated with the south fork of the Lemonweir River.

WDNR's Bureau of Endangered Resources reports no known occurrences of threatened or endangered species, or natural areas in the vicinity of the site. The U.S. Fish and Wildlife Service does report that endangered and threatened species occur in Monroe County. However, the U.S. Fish and Wildlife Service believes that these species are not being adversely affected by conditions at the site.

5. Contamination

Phase I RI

In July, 1993, U.S. EPA, in cooperation with WDNR and the United States Geological Survey (USGS), collected groundwater and subsurface soil samples and had them analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals as part of a Phase I RI. The Phase I sampling locations are shown on Figure 2. Sampling results indicated that contaminants within the landfill boundaries (on-site) and in discrete locations outside the boundaries of the landfill (off-site) are present in concentrations above state and/or federal standards.

The primary contaminants of concern in ground water are lead, found primarily on-site at sampling locations W-16, W-17, W-18, W-19, and W-20, and trichloroethene (TCE), found in one sample location on-site, W-20, and one sample location off-site, W-24.

The evaluation of the nature and extent of contamination in the subsurface soils indicated that, although some contamination occurs at depth, primarily lead and benzo(a)pyrene, the concentrations detected do not warrant further investigation. However, the Phase I RI concluded the surface soils needed to be characterized to evaluate risks associated with direct contact at the landfill area through unrestricted access.

Phase II RI

Field investigations for the Phase II RI included installation of monitoring wells for sampling ground water and the sampling of surface soils on and off the landfill. The location of the Phase II sample locations is shown in Figures 3 and 4. Regional groundwater flow is east-northeast and shallow groundwater flow is to the north-northwest, putting MW-1, MW-3, and MW-4 downgradient.

The results of the groundwater sampling indicated the presence of TCE in all the monitoring wells. However, TCE concentrations in the upgradient wells, MW-2 and PZ-2, were significantly higher than those in the downgradient wells. 1,2-dichloroethene (1,2 DCE) and 1,2-dichloroethane (1,2 DCA) were also detected in substantially higher concentrations in the upgradient wells.

To help streamline the project, the Phase II surface soil sampling concentrated on the two main chemicals of concern, benzo(a)pyrene and lead, determined from the results of the Phase I subsurface soil sampling. Approximately 48 surface soil samples were collected at locations on and off the landfill and analyzed for benzo(a)pyrene and lead.

The Phase II investigation also included extensive geophysics and test pitting to determine the boundaries of the landfill. Figure 5 shows the results of the geophysical investigation. Since the boundaries of the landfill encroached on other properties besides the Armory property, the entire site was divided into parcels. These parcels are also shown on Figure 5.

VI. Summary of Site Risks

Based on data collected during the RI, human health and ecological risks associated with contaminants detected in soils and ground water within and near the site were assessed. This assessment, called a baseline screening, was conducted to compare contamination levels at the site with U.S. EPA and state standards. It considered ways in which people and wildlife could be exposed to site-related contaminants and whether such exposure could increase the incidence of cancer and noncarcinogenic (noncancer related) diseases above the levels that normally occur in the study area.

Results of the groundwater investigation indicated that the inorganic contaminants are found inside the boundaries of the landfill and the organic groundwater contamination is from a source upgradient from the Armory Landfill site. Tables 1, 2, 3, and 4 are summaries of the Phase I and II groundwater data. During the Phase I investigation, inorganic contaminants, most importantly lead, were detected inside the boundaries of the landfill at levels above the federal maximum contaminant level (MCL). Lead was also found in one location outside the boundary of the landfill at a concentration (15.3 Ig/l) slightly above the MCL (15.0 Ig/l). Phase II groundwater sampling performed outside the boundaries of the landfill did not detect lead in any wells above the MCL. Organic contaminants in ground water were found inside and outside the boundaries of the landfill. The Phase I sampling detected trichloroethene (TCE) inside the boundaries of the landfill and downgradient at concentrations above the MCL (5 Ig/l). The Phase II sampling confirmed the presence of TCE and detected other organic contaminants outside the boundaries of the landfill. However, the Phase II sampling also detected these organic constituents in upgradient wells at greater concentrations. Follow-up, to help determine potential sources for the organic contamination, confirmed the presence of a site with leaking storage tanks upgradient to the Armory landfill. The State of Wisconsin is addressing the presence of a contaminated upgradient site. The U.S. EPA concluded that the organic contamination was from a source other than the landfill and that ground water under the landfill would not be used as a drinking water source, since the area around the landfill site, together with the rest of the City of Tomah, is currently served by municipal water. Given that the municipal system has adequate capacity for expansion, U.S. EPA believes that future development on-site would use municipal water as well. Ground water at the site will be monitored because waste will be left in place and to ensure that groundwater conditions at the site continue to pose no significant risk. Results of the future groundwater monitoring will be evaluated after five years to determine the need to continue monitoring.

Moving on from groundwater issues, the assessment focused on risks associated with exposure to surface and subsurface soils. It assumed that the degree of exposure to surface and subsurface soils is strongly related to land use patterns. The assessment therefore evaluated risks under current and expected future land use conditions.

Current land use and reasonably anticipated future use of the land at NPL sites are important considerations in determining current risks, future potential risks, and the appropriate extent of remediation. (See "Land Use in the CERCLA Remedy Selection Process," OSWER Directive No. 9355.7-04, May 25, 1995). Land use assumptions affect the exposure pathways that are evaluated in the risk assessment. The results of the risk assessment aid in determining the degree of remediation necessary to ensure current and long-term protection at the site. The risk assessment considers present use of the site to determine current risks. It may restrict its analysis of future risks to the reasonably anticipated future land use.

Current land use at the Armory Landfill varies and the corresponding exposure possibilities vary as well. To take this variability into account, the risk assessment divided the Armory Landfill into land parcels (Figure 5). The parcels include: 1) the Wisconsin Army National Guard (Armory) area, a parcel containing the National Guard facility; 2) the Museum and Trespasser areas, a parcel containing the museum and a small area across Woodward Avenue easily accessible to trespassers, including children at play; and 3) the Sewage Treatment Plant area, a parcel containing the sewage treatment facility. It should be mentioned that the small area across Woodward Avenue, area 3 in Figure 5, was excavated and the excavated material was disposed offsite. Also a portion of the museum property, area I on Figure 5, was

graded, covered and reseeded. This work was voluntarily conducted in 1997 by the Wisconsin ARNG upon recommendation of the WDNR. The risk assessment focused upon users who would face the greatest exposure in each of these areas, i.e., those people who would be most likely to come into contact with contaminated soils. In all three areas, maintenance workers, whose duties might include mowing lawns or construction work, seemed to be the group most likely to be exposed. In addition, for the Museum and Trespasser parcel, the assessment calculated risks to children who might occasionally play on the property.

In extending the analysis to future conditions, the risk assessment took into consideration the reasonably anticipated future land use. It is assumed that future land use would stay more or less the same, with continued light industrial zoning for the site itself, and residential and commercial uses nearby. Such land use might include the construction of additional buildings and/or maintenance of the current buildings on the site. New construction might be industrial, commercial, or residential in character. Under these conditions, the risk assessment identified as the focus group for estimating future site risks, on-site workers who may excavate soils for repair or construction purposes.

U.S. EPA uses conservative estimates when evaluating potential risks. This approach may overstate the true risks, but it provides a high level of protection for public health and the environment. In the case of the Armory Landfill, soil samples revealed a range of concentrations for certain chemicals of concern. Tables 5 and 6 contain summaries of the surface and subsurface soil data. The risk evaluation estimated an exposure point concentration (EPC) by calculating the 95 percent upper confidence limit of the mean. For surface soils, EPCs were estimated for benzo(a)pyrene and lead in each of the parcels under current conditions and for the overall site using the hypothetical future scenario. For subsurface soils, EPCs were estimated for benzo(a)pyrene, arsenic, barium, beryllium, chromium, lead, manganese, nickel and thallium in the Armory and Museum parcels. The EPC was then compared to background concentrations, soil screening levels (SSLs), risk based concentrations (RBCs), and/or a calculated adult lead cleanup level. The SSLs were based on U.S. EPA guidance documents. (See "Risk-Based Concentration Table", Roy L. Smith, Office of RCRA, Region 3, U.S. EPA, latest update; Soil Screening Guidance, OSWER EPA/540/RO94/101, 1994; and "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities", OSWER Directive #9355.4-12, July 14, 1994). RBCs were developed using standard U.S. EPA risk calculations to determine screening levels for industrial and residential scenarios based on risk factors of 1×10^{-6} to 1×10^{-4} . (See "Risk-Based Concentration Table", Roy L. Smith, Office of RCRA, Region 3, U.S. EPA, latest update). Calculation of the adult lead clean-up model is presented in Appendix O of the TAL RI Report, January 1997. In general, when an EPC falls below the background concentration or the SSL no further action or study will be required. EPCs that fall above the background and the SSL or where a specific SSL does not exist, do not automatically trigger an action but warrant further site-specific risk evaluation by comparison with RBCs or the calculated adult lead cleanup level.

In general, low levels of contamination have been observed in the surface and subsurface soil throughout the landfilled area and there do not appear to be any hot spots (See Tables 5 and 6). Methane and organic vapors were not detected during the sampling of surface soil, indicating that volatilization of landfill gases to the atmosphere is limited under existing conditions. In addition, based on site specific conditions, including the size and depth of the landfill, the distance of the surrounding residential areas from the landfill, and current deed restrictions that eliminate possible exposures, U.S. EPA concluded that migration of subsurface landfill gas was not a significant or completed pathway of concern. The potential for release of contaminated dust to the atmosphere is limited based on the relatively heavy vegetative or gravel covers over most of the contaminated areas. Moreover, activities such as excavation or grading that might release contaminants to the air require WDNR approval under existing property restrictions.

Surface Soils

Risk associated with exposure to surface soils at the Armory Landfill were evaluated for the current maintenance workers and trespassers, and the hypothetical future on-site construction

worker. As mentioned previously, the surface soil sampling was primarily concerned with the concentrations of benzo(a)pyrene and lead. Under current conditions risks were assessed for the various parcels, including the Museum and Trespasser, Armory, and Sewage Treatment Plant, areas (See Figure 5). For all three areas, surficial soils EPCs were compared to industrial value guidelines. Additionally for the Museum and Trespasser area, residential values were also used for comparison. Table 7 contains a summary of the risk analysis for surface soils.

For all the areas, the EPCs for benzo(a)pyrene and lead were slightly above background concentrations. However, for all the areas, the EPCs for benzo(a)pyrene fell below the 1×10^{-6} risk based concentration for industrial soil ingestion and the EPCs for lead were below the SSL and the lead cleanup level calculated in the modeling. For the hypothetical future scenario, a separate site-wide EPC was calculated for benzo(a)pyrene and lead. The future scenario EPC for benzo(a)pyrene was within the 1×10^{-6} to 1×10^{-5} risk based concentration range for residential and industrial soil ingestion. The future scenario EPC for lead was below the SSL and the adult lead cleanup level.

Subsurface Soils

This assessment evaluated risk associated with exposure to subsurface soils at the Armory Landfill for the hypothetical future construction worker. Subsurface soils were collected at depths intervals of 3 to 5 feet or 9 to 11 feet. Risks were assessed for various parcels and considered a wider range of chemicals than the surface soils, including arsenic, barium, beryllium, chromium, lead, manganese, nickel, and thallium and benzo(a)pyrene. EPCs were calculated for each one of these chemicals in the Armory and Museum parcels. All the EPCs exceeded background concentrations except for thallium, which was not further evaluated. Of the remaining chemicals, arsenic, beryllium, and benzo(a)pyrene are carcinogens. Chromium VI and nickel, as a refinery dust, are carcinogens via inhalation. Because nickel is only carcinogenic as a refinery dust and this form of nickel was not found at the site, the EPC for nickel was compared to the noncarcinogenic RBC for industrial soil ingestion and the SSL-transfers from soil to air. EPCs for barium, lead, and manganese were also compared to their respective noncarcinogenic RBCs and SSLs. Table 8 contains a summary of the risk analysis for subsurface soils.

At the Armory Area, benzo(a)pyrene, beryllium, and chromium EPCs fell below the 1×10^{-6} risk based concentration for industrial exposures. The arsenic EPC fell between the 1×10^{-6} and 1×10^{-5} risk based concentration range. None of the chemicals exceeded their respective risk based concentrations for noncarcinogenic effects or the SSLs for transfer of soil to air.

At the Museum area, benzo(a)pyrene, beryllium, and chromium EPCs fell below the 1×10^{-6} risk based concentration for industrial exposures. The arsenic EPC fell between the 1×10^{-6} and 1×10^{-5} risk based concentration range. None of the chemicals exceeded their respective risk based concentrations for noncarcinogenic effects or the SSLs for transfer of soil to air.

Lead EPCs in the Armory and Museum area exceed the residential SSL of 400 mg/kg, but are considerably below the RBC for lead in subsurface soils of 36,000 mg/kg calculated by using the adult lead cleanup model assuming industrial use at the site.

Ecological Risk Assessment

Ecological risks to animals, plants, etc., are not expected to be significant because the Armory Landfill is located in an urban setting and soil is the primary means by which exposure can occur. No evidence of stresses to wildlife was observed during the field investigation.

Selected Remedy

Based on the information collected to date on the site contamination and associated risks to human health and the environment, U.S. EPA believes that no remedial action is necessary. Contamination from the landfill poses no significant risk under the current land use and the reasonably anticipated future land use at the site. Protections against inappropriate land use are already in place in the form of restrictive covenants, enforceable by the Wisconsin Department of Natural Resources. Ordinarily, U.S. EPA identifies one or more engineering controls to address contamination at a Superfund site and compares them in a feasibility study. But the lack of significant risks eliminated the need for such a study in this case. U.S. EPA therefore selects a "No Action" decision for this site. In addition, since waste material will be left in place and because there is contaminated ground water under the landfill itself, U.S. EPA is requiring groundwater monitoring to ensure that groundwater conditions at the site continue to pose no significant risk.

In light of our decision not to select a remedial action, the requirements of CERCLA section 121 - including the provisions concerning applicable or relevant and appropriate requirements - are not triggered; that section applies only in those cases where a remedial action is selected.

VII. Explanation of Significant Changes

There are no significant changes from the recommended alternative described in the proposed plan.

VIII. State Concurrence

Based on its review on the remedial investigation, WDNR is concerned about the groundwater monitoring component included in the proposed remedy. WDNR believes the U.S. EPA's concerns regarding a change in site conditions can be addressed by U.S. EPA through a site inspection at a future date. The purpose of the site inspection would be to document that land use conditions have not changed, restrictive covenants remain viable, and that remedial progress is being made at the off-site groundwater contamination source.

Despite this concern, the State of Wisconsin has indicated a willingness to concur with this decision. A written confirmation is expected by September 30, 1997 and will be added to the administrative record upon receipt.

FIGURES

TABLE 1
INORGANICS IN GROUNDWATER AT TOMAH ARMORY, PHASE I

Sample Location	W-16	W-17	W-18	W-19	W-20	MCL	Secondary MCL	WPHGQ Enf. St.	WPWGQ Enf. St.	Risk Conc.
Analyte	Concentration (Ig/l)									
Aluminum	638.2	1650.5	3940.5	2172.9	515.1	-	50.0	-	-	-
Arsenic	ND	24.2	4.9	ND	ND	50.0	-	50.0	-	11.0
Iron	3018.8	4904.6	8407.2	42640.0	28119.0	-	300.0	-	300.0	-
Lead	67.9	86.5	46.5	310.5	16.6	15.0*	-	15.0	-	-
Manganese	733.8	107.7	850.9	1740.7	1464.3	-	50.0	-	50.0	180.0
Nickel	ND	13992.0	ND	16.1	ND	100.0	-	-	-	730.0

* - This value is the Federal Action Level

Key:

Concentrations in bold face exceed one or more standards

MCL - Federal Maximum Contaminant Levels

Secondary MCL - Federal Groundwater Quality Maximum Contaminant Levels

WPHGQ Enf. St. - Wisconsin Public Health Groundwater Quality Enforcement Standards

WPWGQ Enf. St. - Wisconsin Public Welfare Groundwater Quality Enforcement Standards

Risk Conc. - Risk-Based Concentration for Tap Water from U.S. EPA, Region III, Risk-Based Concentration Table, July 11, 1994

ND - Compound not detected in analysis

(-) - Analyte not listed in Table

TABLE 1
INORGANICS IN GROUNDWATER AT TOMAH ARMORY, PHASE I
(continued)

Sample Location	W-21	W-22	W-23	W-24	W-25	MCL	Secondary MCL	WPHGQ Enf. St.	WPWGQ Enf. St.	Risk Conc.
Analyte	Concentration (Ig/l)									
Aluminum	3494.9	6109.0	3523.0	760.89	1458.1	-	50.0	-	-	-
Arsenic	ND	ND	ND	ND	ND	50.0	-	50.0	-	11.0
Iron	12225.0	19617.0	5497.9	38638.0	14719.0	-	300.0	-	300.0	-
Lead	7.8	15.3	10.6	7.6	5.65	15.0*	-	15.0	-	-
Manganese	1363.6	411.6	678.88	2264.3	1246.4	-	50.0	-	50.0	180.0
Nickel	16.1	29.3	ND	ND	12.1	100.0	-	-	-	730.0

* - This value is the Federal Action Level

Key:

Concentrations in bold face exceed one or more standards

MCL - Federal Maximum Contaminant Levels

Secondary MCL - Federal Groundwater Quality Maximum Contaminant Levels

WPHGQ Enf. St. - Wisconsin Public Health Groundwater Quality Enforcement Standards

WPWGQ Enf. St. - Wisconsin Public Welfare Groundwater Quality Enforcement Standards

Risk Conc. - Risk-Based Concentration for Tap Water from U.S. EPA, Region III, Risk-Based Concentration Table, July 11, 1994

ND - Compound not detected in analysis

(-) - Analyte not listed in Table

TABLE 2
VOLATILE/SEMIVOLATILE ORGANICS IN GROUNDWATER AT TOMAH ARMORY, PHASE I

Sample Location	W-16	W-17	W-18	W-19	MCL	WPHGQ Enf. St.	Risk Conc.
Compound	Concentration (Ig/l)						
Volatiles							
Chloroform	ND	1.0	2.0	ND	5.0	6.0	0.15
Trichloroethene	98.0	ND	ND	16.0	5.0	5.0	1.6
Semivolatiles	ND	1.0	1.0	10.0	-	3.0	4.8
bis(2-ethylhexyl)phthalate*							

* - Compound also detected in laboratory or field blanks

Key:

Concentrations in bold face exceed one or more standards

ND - Compound not detected in analysis

MCL - Federal Maximum Contaminant Levels

WPHGQ Enf. St. - Wisconsin Public Health Groundwater Quality Enforcement Standards

Risk Conc. - Risk-Based Concentration for Tap Water from U.S. EPA, Region III, Risk-Based Concentration Table, July 11, 1994

(-) - Analyte not listed in Table

Table 3 Groundwater Quality Data, November 1995, Volatile Organic Compounds (VOCs) and Inorganics 1, Tomah Armory Landfill Site, Tomah, Wisconsin, Phase II

	Upgradient				Downgradient			
Sample I.D.	MW-02	PZ-02	MW-01	Dup MW-01 MW-99	PZ-01	MW-03	MW-04	
Laboratory I.D.	A5K040107002	A5K040107006	A5K040107001	A5K040107007	A5K040107005	A5K040107003	A5K040107004	
Sample Date	11/02/95	1/02/95	1/02/95	11/02/95	11/02/95	11/02/95	11/02/95	
VOCs								
Chloroform	< 5.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloromethane	< 5.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethane	< 5.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethane	< 5.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethene	< 5.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloroethene	< 2.5 J	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,1,1-Trichloroethane	< 5.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloroethane	< 3.0 J	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	
Trichloroethene	160 J	26	< 1.0	< 1.0	11	1.9	2.5	
Vinyl chloride	< 2.5 J	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,2-Dichloroethene (total)	32 J	6.2	< 1.0	< 1.0	< 5.4	< 1.0	< 1.0	
INORGANICS								
Arsenic -Dissolved	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Lead -Dissolved	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	
FIELD PARAMETERS								
pH 2	6.6	5.7	7.8	7.8	7.5	6.0	6.6	
Specific Conductance (IS)	550	330	280	280	440	270	680	
Temperature (5C)	10	9	11	11	11	11	11	

1 All concentrations are reported in Ig/L (micrograms per liter).
2 pH measured in standard pH units.
J Estimated concentration.

Table 4 Groundwater Quality Data, February 1996, Volatile Organic Compounds (VOCs) and Inorganics 1, Tomah Armory Landfill Site, Tomah, Wisconsin, Phase II

Sample I.D. Laboratory I.D. Sample Date	Upgradient				Downgradient			
	Dup MW-02							
	MW-02	MW-98	PZ-02	MW-01	PZ-01	MW-03	MW-03	
	A6B140133003	A6B140133008	A6B140133008	A6B140133001	A6B140133002	A6B140133005	A6B140133006	
	02/13/96	2/13/96	2/13/96	2/13/96	02/13/96	02/13/96	02/13/96	
VOCs								
Chloroform	< 3.3 J	< 3.3 J	< 2 J	< 1.0	< 2.0 J	< 1.0	< 1.0	
Chloromethane	< 3.3 J	< 3.3 J	< 2.0 J	< 1.0	< 2.0 J	< 1.0	< 1.0	
1,1-Dichloroethane	< 3.3 J	< 3.3 J	< 2.0 J	< 1.0	< 2.0 J	< 1.0	< 1.0	
1,2-Dichloroethane	6.4 J	5.7 J	< 2.0 J	< 1.0	< 2.0 J	< 1.0	< 1.0	
1,1-Dichloroethene	< 3.3 J	< 3.3 J	< 2.0 J	< 1.0	< 2.0 J	< 1.0	< 1.0	
Tetrachloroethene	< 1.7 J	< 1.7 J	< 1.0 J	< 0.50	< 1.0 J	< 0.50	< 0.50	
1,1,1-Trichloroethane	< 3.3 J	< 3.3 J	< 2.0 J	< 1.0	< 2.0 J	< 1.0	< 1.0	
1,1,2-Trichloroethane	< 2.0 J	< 2.0 J	< 1.2 J	< 0.60	< 1.2 J	< 0.60	< 0.60	
Trichloroethene	94 J	83 J	48 J	< 1.0	48 J	2.4	2.4	
Vinyl chloride	< 1.7 J	< 1.7 J	< 1.0 J	< 0.50	< 1.0 J	< 0.50	< 0.50	
1,2-Dichloroethene (total)	24 J	18 J	14 J	< 1.0	8.0 J	< 1.0	1.1	
INORGANICS								
Arsenic -Dissolved	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Lead -Dissolved	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	4.7	
FIELD PARAMETERS								
pH 2	7.7	7.7	7.3	8.4	8.3	7.5	7.3	
Specific Conductance (IS)	670	670	460	330	570	960	970	
Temperature (5C)	5.8	5.8	7.6	4.5	8.3	6.4	7.3	

1 All concentrations are reported in Ig/L (micrograms per liter).
2 pH measured in standard pH units.
J Estimated concentration.
4.7 Downgradient concentration greater than background level.

Table 5 Occurrence Summary of Surface Soil Samples, Phase I/Phase II RI, Tomah Armory Landfill Site, Tomah, Wisconsin.

COPC	Frequency Detects / Total	Range of SQLs Min - Max	Range of Detects Min - Max	Average Detect	Mean	UCL	EPC
Armory Area							
Benzo(a)pyrene	7 / 12	0.044 - 0.047	0.048 - 0.41	0.14	0.089	0.15	0.15
Lead	12 / 12	- - -	3.6 - 80.2	33	33	47	47
Museum Area							
Benzo(a)pyrene	5 / 8	0.044 - 0.046	0.21 - 1.3	0.63	0.4	0.72	0.72
Lead	8 / 8	- - -	6.3 - 422	140	140	260	260
Sewage Plant Area							
Benzo(a)pyrene	3 / 9	0.043 - 0.045	0.076 - 0.40	0.21	0.084	0.16	0.16
Lead	9 / 9	- - -	8.3 - 52.4	26	26	37	37
Trespasser Area							
Benzo(a)pyrene	8 / 12	0.043 - 0.046	0.048 - 1.3	0.41	0.28	0.49	0.49
Lead	12 / 12	- - -	6.3 - 422	110	110	190	197
All Surface Soils							
Benzo(a)pyrene	18 / 38	0.042 - 0.047	0.048 - 3.9	0.44	0.22	0.4	0.4
Lead	38 / 38	- - -	3.6 - 422	53	53	79	79

All concentrations are reported in milligrams per kilogram (mg/kg).

COPC Constituents of potential concern.

-- Indicates that COPC was detected in all samples.

EPC Exposure point concentration; lesser of the UCL and the maximum detected concentration rounded to two significant numbers.

Mean Arithmetic average of the total number of samples, using proxy concentrations for non-detects.

SQLs Practical sample quantitation limits for the non-detects.

UCL The upper 95 percent one-tailed confidence interval on the mean for normally distributed data.

Table 6 Occurrence Summary of Subsurface Soil Samples for Armory and Museum Area, Phase I/Phase II RI, Tomah Armory Landfill Site, Tomah, Wisconsin.

COPC	Frequency Detects / Total	Range of SQLs Min - Max	Range of Detects Min - Max	Average Detect	Mean	UCL	EPC
ARMORY AREA							
Benzo(a)pyrene	1 / 1	- -	- - 0.11	-	-	-	0.11
Arsenic	3 / 7	0.96 - 0.96	6.7 - 14.7	10	5	9	8.8
Barium	3 / 7	3.59 - 361	118 - 799.6	440	190	420	420
Beryllium	4 / 7	0.48 - 0.48	0.5 - 2.1	1	1	1	1.2
Chromium	5 / 7	1.44 - 1.45	1.6 - 45.6	19	14	26	26
Lead	7 / 7	- -	2.5 - 1800	420	420	910	910
Manganese	7 / 7	- -	2.4 - 931.2	210	210	460	460
Nickel	4 / 7	2.87 - 2.88	3.7 - 45.7	28	17	31	31
Thallium	4 / 7	0.97 - 0.97	0.7 - 0.9	1	0.67	0.8	0.8
MUSEUM AREA							
Benzo(a)pyrene	1 / 1	- -	- - 0.14	-	-	-	0.14
Arsenic	1 / 1	- -	- - 21	-	-	-	21
Barium	1 / 1	- -	- - 630	-	-	-	630
Beryllium	1 / 1	- -	- - 1.2	-	-	-	1.2
Chromium	1 / 1	- -	- - 57	-	-	-	57
Lead	1 / 1	- -	- - 4060	-	-	-	4100
Manganese	1 / 1	- -	- - 770	-	-	-	770
Nickel	1 / 1	- -	- - 130	-	-	-	130
Thallium	1 / 1	- -	- - -	-	-	-	-

All concentrations are reported in milligrams per kilogram (mg/kg).

COPC Constituents of potential concern.

- - Indicates that COPC was detected in all samples.

EPC Exposure point concentration; lesser of the UCL and the maximum detected concentration rounded to two significant numbers.

Mean Arithmetic average of the total number of samples, using proxy concentrations for non-detects.

SQLs Practical sample quantitation limits for the non-detects.

UCL The upper 95 percent one-tailed confidence interval on the mean for normally distributed data.

Table 7 Comparison of Surface Soil Data to Background Concentrations and Risk-Based Guidelines, Tomah Armory Landfill Site, Tomah, Wisconsin.

Source	Parameter	EPC (1)	Background Concentration (2)	RBC Industrial (3)			Adult Lead Cleanup Level (4)	SSL (5) Transfer From Soil to Air
				10 -6	10 -5	10 -4		
Museum	Benzo(a)pyrene (a)	0.72	0.067	0.78	7.8	78	NA	11 (6)
	Lead	260	36	ND	ND	ND	36,000	ND
Armory	Benzo(a)pyrene (a)	0.15	0.067	0.78	7.8	78	NA	11 (6)
	Lead	47	36	ND	ND	ND	36,000	ND
Sewage Plant	Benzo(a)pyrene (a)	0.16	0.067	0.78	7.8	78	NA	11 (6)
	Lead	37	36	ND	ND	ND	36,000	ND
All Surficial Soils	Benzo(a)pyrene	0.4	0.067	0.78	7.8	78	NA	11 (6)
	Lead	79	36	ND	ND	ND	36,000	ND
Source	Parameter	EPC (1)	Background Concentration (2)	RBC Residential (7)			Residential SSL (5)	SSL (5) Transfer From Soil to Air
				10 -6	10 -5	10 -4		
Trespasser	Benzo(a)pyrene (a)	0.49	0.067	0.088	0.88	8.8	0.09	11 (6)
	Lead	190	36	ND	ND	ND	400	ND

- NANot applicable.
- NDNot determined.
- mg/KgMilligrams per kilogram.
- (a)Carcinogen.
- (1)Exposure Point Concentration.
- (2)Concentrations are the average background concentrations times two. Background samples include: BKSS-01 thru BKSS-06. Benzo(a)pyrene was detected in the duplicate of BK22-02.
- (3)Risk-Based Concentration, Industrial Soil Ingestion (USEPA, 1996).
- (4)Adult lead cleanup level calculated using a frequency of 28 d/yr exposure (USEPA, Region VI, 1995).
- (5)Soil Screening Level (USEPA, 1994)
- (6)Soil Saturation Limit.
- (7)Risk-Based Concentration, Residential Soil Ingestion (USEPA, 1996).

Table 8 Comparison of Subsurface Soil Data to Background Concentrations and Risk-Based Guidelines, Tomah Armory Landfill Site, Tomah Wisconsin.

COPC	EPC	Background	RBC Industrial (2)			RBC Industrial	SSL(3)Transfers	
		Concentration(1)	10 -6	10 -5	10 -4	Noncarcinogenic Effects	From Soil to Air	
Armory Area								
Carcinogens								
	Benzo(a)pyrene	0.11	- -	0.78	7.8	78	NE	11a
	Arsenic	8.8	3.2	3.8	38	380	610	380
	Beryllium	1.2	0.7	1.3	13	130	NE	690
	Chromium*	26	6.1	10,000*	100,000*	1,000,000*	10,000	140
	Nickel**	31	5.8	ND	ND	ND	41,000	6,900
Inorganics								
	Barium	420	8.2	NA	NA	NA	140,000	350,000
	Lead	910	6.6	ND	ND	ND	36,000 (4)	ND
	Nickel	31	5.8	NA	NA	NA	41,000	6,900
	Manganese	460	24.6	NA	NA	NA	10,000	ND
	Thallium,	0.8	1.2	NA	NA	NA	ND	ND

mg/kg Milligrams per Hogram.

- - Not detected.

* Value is for chromium VI.

** Nickel is a carcinogen via refinery dust inhalation, this is not applicable to this site.

ND Not determined.

NA Not applicable.

NE Not established.

EPC Exposure point concentration; lesser of the UCL and the maximum detected concentrations rounded to two significant numbers.

a Soil saturation soil.

(1) Concentrations are the average background concentrations times two.
Background samples include: B19DB (3-5 ft) and B19DB (9-11 ft).

(2) Risk-Based Concentration, Industrial Soil Ingestion (USEPA, Region III, 1996).

(3) Soil Screening Levels, Residential Values (USEPA, 1994).

(4) Adult lead cleanup level calculated using a frequency of 28 d/yr exposure (USEPA, Region IV, 1995).

Table 8 Comparison of Subsurface Soil Data to Background Concentrations and Risk-Based Guidelines, Tomah Armory Landfill Site, Tomah, Wisconsin.

COPC		EPC	Background Concentration (1)	RBC Industrial (2)			RBC Industrial Noncarcinogenic Effects	SSL (3) Transfers From Soil to Air
Museum Area Carcinogens								
	Benzo(a)pyrene	0.14	- -	0.78	7.8	78	NE	11a
	Arsenic	21	3.2	3.8	38	380	610	380
	Beryllium	1.2	0.7	1.3	13	130	NE	690
	Chromium*	57	6.1	10,000*	100,000*	1,000,000*	10,000	140
	Nickel**	130	5.8	ND	ND	ND	41,000	6,900
Inorganic								
	Barium	630	8.2	NA	NA	NA	140,000	350,000c
	Lead	4100	6.6	ND	ND	ND	36,000 (4)	ND
	Manganese	760	24.6	NA	NA	NA	10,000	ND
	Nickel	130	5.8	NA	NA	NA	41,000	6,900
	Thallium	- -	1.2	NA	NA	NA	NA	ND

mg/kg Milligrams per kilogram
- - Not detected
* Value is for chromium VI.
** Nickel is a carcinogen via refinery dust inhalation, this is not applicable to this site.
ND Not determined.
NA Not applicable.
NE Not established.
EPC Exposure point concentration; lesser of the UCL and the maximum detected concentrations rounded to two significant numbers.
a Soil saturation soil.
(1) Concentrations are the average background concentrations times two.
Background samples include: B19DB (3-5 ft) and B19DB, (9-11 ft).
(2) Risk-Based Concentration, Industrial Soil Ingestion (USEPA, Region III, 1996).
(3) Soil Screening Levels, Residential Values (USEPA, 1994).
(4) Adult lead cleanup level calculated using a frequency of 28 d/yr exposure (USEPA, Region IV, 1995).

APPENDIX A

RESPONSIVENESS SUMMARY TOMAH ARMORY LANDFILL TOMAH, MONROE COUNTY, WISCONSIN

PURPOSE

This responsiveness summary has been prepared to meet the requirements of Sections 113(k)(2)(B)(iv) and 117(b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), which requires the United States Environmental Protection Agency (U.S. EPA) to respond to each of the significant comments, criticisms, and new data submitted in written and oral presentations on a proposed plan for remedial action. The responsiveness summary provides a summary of residents' comments and concerns identified and received during the public comment period, and U.S. EPA's responses to those comments and concerns. All comments received by U.S. EPA during the public comment period were considered in the selection of the remedial alternative for the Tomah Armory Landfill (TAL). The responsiveness summary serves two purposes: it summarizes community preferences and concerns regarding the remedial alternatives, and it shows members of the community how their comments were incorporated into the decision-making process.

This document summarizes written and oral comments received during the public comment period of July 25, 1996 to August 25, 1996. The public meeting was held at 6:00 p.m. on August 18, 1996 at the Tomah City Hall Council Chambers, Tomah, Wisconsin. A full transcript of the public meeting, as well as all site related documents, are available for review at the information repository, located at the Tomah Public Library, 716 Superior Avenue, Tomah, Wisconsin. The only official comments received were from the Wisconsin Department of Natural Resources (WDNR).

OVERVIEW

The proposed remedial alternative for the Tomah Armory Landfill was announced to the public just prior to the beginning of the public comment period. U.S. EPA proposed no action.

WDNR Comments

1. Comment: The Wisconsin Department of Natural Resources (WDNR) and United States Environmental Protection Agency (U.S. EPA) have agreed that the groundwater impacts of volatile organic compounds (VOCs) in the vicinity of the landfill are likely from a recently identified upgradient source. The VOCs identified exceed drinking water standards and therefore are likely to pose significant risk to potential future users of the ground water in this area. With this in mind, it does not appear logical that long-term groundwater monitoring at the site will in fact confirm that the "groundwater conditions at the site continue to pose no significant risk".

Response: U.S. EPA means by the statement, "groundwater conditions at the site continue to pose no significant risk," that groundwater conditions attributable to the TAL continue to pose no significant risk. This statement could be true, even though a source other than TAL has released in the vicinity of the landfill VOCs in excess of drinking water standards. In requiring some additional groundwater monitoring, EPA seeks to confirm that the TAL will not cause any significant deterioration of groundwater quality offsite in the future.

2. Comment: The Proposed Plan states that the ground water was considered to be an unlikely pathway for exposure to contamination because the site is located in an area served by a municipal water system. Furthermore, the City of Tomah has modified the City ordinance to prohibit installation of drinking water wells within 200 feet of the landfill. U.S. EPA did not recognize this in the proposed plan.

Response: A variety of factors were taken into consideration in determining the no-action decision at the TAL, including those related to pathways for exposure. However, a significant element of the no-action decision was the determination that to date contamination from the landfill appeared to be restricted to the area under the landfill and had not moved beyond the boundaries of the landfill. U.S. EPA feels monitoring is needed to ensure that this condition does not change. If contamination related to the landfill is found outside the boundaries additional factors need to be taken into account to address the off-site contamination. This is not to say that the decision could be something other than no-action; however, other actions may become more appropriate, i.e. containment with monitoring, natural attenuation with monitoring, and others.

3. Comment: U.S. EPA has not explained the type or frequency of the groundwater monitoring it is proposing. There are indications that the sampling would include only lead. This seems to be based on the fact that lead was detected in a groundwater sample collected underneath the site. This lead detection came from a geoprobe sample collected during the Phase I Remedial Investigation (RI). The Phase I RI was a screening investigation to determine the level of effort needed to move the site through the next phase. The information collected was used to eliminate some compounds from future sampling. The detection of lead in this sampling round was not confirmed, nor was it discussed previously as a concern given that it was collected from a well which did not meet the criteria in ch. NR 141, Wisconsin Administrative Code. This sample was collected from a geoprobe that was installed through waste and was analyzed for total lead.

Response: The Phase I RI collected geoprobe groundwater samples for screening purposes to determine additional actions at the site. Geoprobe data indicated the presence of inorganic (lead) and VOC (trichloroethene) groundwater contamination at a number of sampling locations inside and outside the boundaries of the landfill. U.S. EPA Policy is to collect unfiltered samples to best mirror existing groundwater conditions. Additionally, the Phase I sampling effort detected the presence of lead in subsurface samples collected within the landfill. The Agencies determined it was appropriate to conduct additional Phase II sampling. Phase II groundwater sampling performed outside the boundaries of the landfill verified the presence of VOCs, but also detected them in upgradient wells at greater concentrations. Inorganic contamination, primarily lead, was not detected at significant levels outside the boundaries of the landfill. Based upon both phases of data collection the U.S. EPA determined that groundwater contamination from the landfill was not significant and no remedial action was necessary. However, because the Phase I sampling effort had discovered the presence of lead contamination in ground water and subsurface soils within the landfill, and these wastes would be left in place as part of the no-action record of decision, the U.S. EPA believed future groundwater monitoring would provide additional insurance that the conditions at the site continue to pose no significant risk. The type and frequency of future groundwater sampling will be determined by the U.S. EPA after signature of the ROD. Responsible parties at the site will be allowed input into the parameters of the sampling.

4. Comment: The Phase II RI groundwater sample collected from an off-site monitoring well contained lead above the Wisconsin Preventive Action Limit (PAL). This result was not confirmed and at the time the Remedial Investigation was being finalized, the WDNR and U.S. EPA agreed that this isolated detection was not considered an exceedance and, therefore, did not necessitate additional investigation or sampling. In addition, this information was evaluated prior to concluding that the site posed no risk and that a Feasibility Study was not necessary.

Response: The U.S. EPA would like to reiterate that, based on the data collected and the risk assessment performed at the site, it has determined that no remedial action is necessary at the site. Since the U.S. EPA determined that there was no significant risk at the site and no remedial action would be selected, a feasibility study was not conducted. Future groundwater monitoring is necessary because waste will be left in place, to ensure that the site continues to pose no significant risk, and to increase the significance of the groundwater data collected to date with additional data points.

5. Comment: Because the WDNR believes that additional groundwater monitoring is not warranted, it has stated to the potential responsible parties at the TAL that the monitoring wells should be abandoned unless the alleged responsible party for the upgradient source of VOC contaminations takes over ownership of them. Chapter NR 141, Wis. Adm. Code requires the abandonment of all wells not used within a year.

Responses: To avoid delays in the future monitoring and prevent additional costs of installing new wells, the U.S. EPA requests that the WDNR consider allowing the responsible parties to maintain the wells for the duration of the future groundwater sampling. Once U.S. EPA has made a determination that groundwater sampling is no longer necessary, the wells can be properly abandoned.

6. Comment: If the U.S. EPA is still concerned about the potential future impacts of lead, which may raise the risk associated with the TAL, the WDNR suggests that U.S. EPA perform a routine inspection of the site with the following purpose:

- to determine whether land use or exposure conditions have changed
- to determine whether institutional controls continue to be viable
- to evaluate the remedial progress being made at the upgradient contaminant source

A qualitative evaluation appears to be a logical, site specific action that will equally address the concerns of the U.S. EPA.

Response: As part of the five year review process the U.S. EPA may include a qualitative evaluation that contains many of the elements proposed in the comment. The U.S. EPA believes future groundwater monitoring will provide additional data to supplement or even replace some of the evaluation criteria listed above.

APPENDIX B
Administrative Record

U.S. EPA ADMINISTRATIVE RECORD
REMEDIAL ACTION
TOMAH ARMORY
TOMAH, WISCONSIN
ORIGINAL
08/30/95

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	03/01/84	Eigenbrodt, V., WDNR	U.S. EPA	Preliminary Assessment	5
2	09/10/84	Sause, A., Ecology and Environment, Inc.	File	August 28, 1984 Site Inspection Report w/Attached Cover Memorandum	16
3	06/00/93	Evans, L., U.S. EPA		Health and Safety Plan for the Tomah Armory Site	80
4	06/00/93	U.S. EPA		Quality Assurance Project Plan for the Tomah Armory and Tomah Fairgrounds Superfund Sites	71
5	06/00/93	U.S. EPA		Work Plan for the Tomah Armory and Tomah Fairgrounds Superfund Sites	203
6	12/00/94	U.S. EPA		Phase I Remedial Investigation Report for the Tomah Armory and Tomah Fairgrounds Landfills (Revision 2)	181

U.S. ENVIRONMENTAL PROTECTION AGENCY
 REMEDIAL ACTION
 ADMINISTRATIVE RECORD
 FOR
 TOMAH ARMORY LANDFILL SITE
 TOMAH, MONROE COUNTY, WISCONSIN
 UPDATE #1
 JULY 17, 1997

NO.	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	03/07/95	Feingold, R., U.S. Senate	Collum, T., U.S. EPA	Letter re: Status of City of Tomah's Superfund Sites	1
2	03/22/95	Adamkus, V., U.S. EPA	Feingold, R., U.S. Senate	Letter re: U.S. EPA's Response to Senator Feingold's March 7, 1995 Letter Concerning the Status of the Tomah Superfund Sites	3
3	04/13/95	Feingold, R., U.S. Senate	Collum, T., U.S. EPA	Letter re: City of Tomah Superfund Sites	8
4	04/28/95	Adamkus, V., U.S. EPA	Feingold, R., U.S. Senate	Letter re: U.S. EPA's Evaluation of City of Tomah's Report Concerning the Hazard Ranking System Site Score and Placement of the Tomah Armory and Fairgrounds Sites on the National Priorities List	3
5	04/28/95	Petri, T., U.S. Congress	Adamkus, V., U.S. EPA	Letter re: Status of Two Landfills in the City of Tomah Considered Super- fund Sites	22
6	05/25/95	Adamkus, V., U.S. EPA	Petri, T., U.S. Congress	Letter re: U.S. EPA's Response to Congressman Petri's April 28, 1995 Letter Concerning Super- fund Sites in Tomah	3
7	09/00/95	Geraghty & Miller, Inc.	State of Wisconsin/ U.S. EPA	Preliminary Site Evaluation Memorandum for the Tomah Armory Landfill Site (DRAFT)	205
8	10/00/95	Geraghty & Miller, Inc.	U.S. EPA	Phase II Remedial investigation Work Plan for The Tomah Armory Landfill Site	612
9	08/01/96	Larsen, C., State of Wisconsin Department of Justice	Mankowski, M., U.S. EPA and W. Anderson, WDNR	Letter re: State of Wisconsin's Proposal for Instituting Deed Restrictions and Institutional Controls at the Tomah Armory Site	3

NO.	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
10	08/19/96	Anderson, W., WDNR	Larsen C., State of Wisconsin Department of Justice	Letter re: State of Wisconsin's Proposal for Voluntary Action at the Tomah Armory Site	2
11	08/28/96	Thurlow, T., U.S. EPA	Larsen, C., State of Wisconsin Department of Justice	Letter re: State of Wisconsin's Proposal for Instituting Deed Restrictions and Institutional Controls at the Tomah Armory Site (UNSIGNED)	2
12	01/00/97	Geraghty Miller, Inc.	State of Wisconsin/ U.S. EPA	Phase II Remedial Investigation Report: Volume 1 of 2 (Text, Tables and Figures) w/Attached January 30, 1997 State of Wisconsin Transmittal Letter for the Tomah Armory Landfill Site	131
13	01/00/97	Geraghty & Miller, Inc.	State of Wisconsin/ U.S. EPA	Phase II Remedial Investigation Report: Volume 2 of 2 (Appen- dices A-Q) for the Tomah Armory Landfill Site	458
14	02/17/97	Larsen, C., State of Wisconsin Department of Justice	Mankowski, M., U.S. EPA	Letter re: Status of State of Wisconsin's Voluntary Actions at the Tomah Armory Site	3
15	03/21/97	Larsen, C., State of Wisconsin Department of Justice	Mankowski, M., U.S. EPA	Letter re: Update to Status of State of Wisconsin's Voluntary Actions at the Tomah Armory Site	2
16	04/30/97	Larsen, C., State of Wisconsin Department of Justice	Laszewski, L., U.S. EPA	Letter re: Update on Progress at the Tomah Armory Site	2
17	06/18/97	Anderson, W., WDNR	Mankowski, M., U.S. EPA	Letter re: WDNR's Comments on the Revised Draft Proposed Plan for the Tomah Armory Site	3
18	06/25/97	Anderson, W., WDNR	Mankowski, M., U.S. EPA	Letter re: WDNR's Additional Comments on the Revised Draft Proposed Plan for the Tomah Armory Site	2

NO.	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
19	06/25/97	Anderson, W., WDNR	Mankowski, M., U.S. EPA	Letter re: Statement of State's Concern to be Included in the Proposed Plan for the Tomah Armory Site	1

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR
TOMAH ARMORY LANDFILL SITE
TOMAH, WISCONSIN

UPDATE #2
JULY 31, 1997

NO.	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	07/00/97	U.S. EPA	Public	Proposed Plan for the Tomah Armory Landfill Site	6

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR
TOMAH ARMORY LANDFILL SITE
TOMAH, WISCONSIN

UPDATE #3
SEPTEMBER 12, 1997

NO.	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	08/12/97	Powell, T. and K. Niesen; Geraghty & Miller, Inc.	Mankowski, M., U.S. EPA and W. Anderson, WDNR	Letter re: Documentation of Completed Voluntary Remedial Actions on the Filkins and Museum Properties at the Tomah Armory Landfill Site	12
2	08/15/97	Anderson, W., WDNR	Bill, B., U.S. EPA	Letter re: WDNR's Comments on the Tomah Armory Proposed Plan	2
3	08/18/97	Southwest Reporters, Inc.	U.S. EPA	Transcript of Procee- dings: August 18, 1997 U.S. EPA Public Meeting re: the Tomah Armory Landfill and Tomah Municipal Sanitary Landfill Sites	102